



Examiner – Joseph Nguyen
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Reply to Notice on 9.27.2002.

I ask to change title
BIPOLAR STATIC INDUCTION DEVICE

B1 mcl "paragraph 0001" The invention relates to a microelectronics and more particularly to a bipolar static induction device – transistor and thyristor (transistor with latch).

B2 "paragraph 0004" The advantage of the offered transistor is that it can operate in both as constant-voltage circuits as alternating-voltage circuits for example 220 V and over, which means that it can be both closed and open with any voltage polarity and have a high technical characteristics: a high current density, a high switch power and a very low on-voltage. Besides, thick channel connected to a separate electrode provides simplification of control circuit.

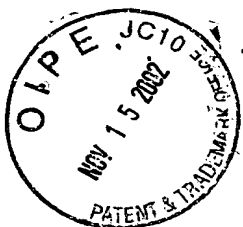
B3 "paragraph 0007" This result is achieved by disposing an epitaxial layer with the impurity concentration about 10.sup.17 cm.sup.3 on each of (the) sides of said lightly doped substrate of the same type of conductivity (with the impurity concentration about 10.sup.17 cm.sup.3), in which said elements of (the bipolar static induction) said transistor: (a) said gate, (a) said source and (a) said channel – as well as electrodes and (the) isolation are disposed.

"between paragraph 0008 and 0009". "canceled".

"between paragraph 0009 and 0010" For manufacturing offered transistors use a lightly doped substrate of monocrystalline silicon with large life time. There are different operating duties of transistor on-condition.

B4 1. A hole concentration approximately the same in whole lightly doped area. Diffusion current is negligible. Gate which disposed near the drain of the transistor emits holes in the channel and the lightly doped area. Holes drift to the source of the transistor and is extracted by gate which disposed near the source. Electrons drift to meet holes – from the source to the drain of the transistor. Electron concentration equals approximately hole concentration. Electron current bigger in 3 times, than hole current, owing to electron mobility is bigger in 3 times. Feature of operation duty – low current amplification factor.

2. A hole concentration near the source of the transistor essentially bigger than one near the drain (trapezoidal distribution). Owing to this, a hole current consists of two parts: a hole diffusion, directed from the source to the drain and a hole drift, directed from the drain to the source. The hole current can be for example equal zero (zero approximation). An electron concentration approximately equals the hole concentration. An electron diffusion current and the electron drift current direct the same direction – from the drain to the source. So almost all current is transferred by electrons. Small hole current is at the expense of recombination holes and electrons in the source and smaller one is at the expense of recombination in the drain. Big hole currents flow through gates at a switching over of the transistor only. At an



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	Group Art Unit	2815	
	Examiner Name	Joseph Nguyen	
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ENCLOSURES (check all that apply)		
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Firm or Individual name	Edlin Solomon
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